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STATEMENT OF WORK
SLUDGE SAMPLING AND ANALYSIS,
FACULTATIVE LAGOON, AMCHITKA, ALASKA
13 JANUARY 1997

I. OBJECTIVE. Collect and analyze sludge samples from the facultative lagoon on Amchitka Island, Alaska. Data will be used to determine the best way to comply with 40 CFR 503, Standards for the Use or Disposal of Sewage Sludge.

II. SITE DESCRIPTION. An aerated facultative lagoon was used to treat wastewater generated on Amchitka Island. The lagoon has not been used since September 1993. Basic information on the facultative lagoon is provided below.

- Lagoon Dimensions: 180' X 360' - 64,800 SF (approximate)
- Sludge Volume: Unknown
- Sludge Quality: 2% Solids, potential low level PCB, cadmium, and lead contamination

Figure 1 provides a plan view of the facultative lagoon, and shows improvements made in 1989.

A. Previous Sampling Efforts. Initial testing in 1993 indicated two of seven samples exceeding 40 CFR 503 ceiling pollutant concentrations for lead and PCB. Follow-up tests conducted in 1995 by Foster Wheeler for the Fish and Wildlife Service indicated levels of lead and PCB below ceiling pollutant limits. However, only one of the four sludge samples taken within the lagoon was analyzed by a CLP laboratory. Those sample points are shown on Figure 2, and off-site analytical results are shown in Table 1.

B. Need for Additional Analysis. By compiling the data from three separate sampling events, we have analytical results for all the pollutants listed by 40 CFR 503. However, this is not a strong data set due to a contaminated rinse blank, poor matrix spike and surrogate recoveries, and apparent lack of field QA/QC data.

To determine compliance with 40 CFR 503, one complete data set with a statistically valid sample size and good QA/QC data is needed.

III. SCOPE OF WORK. Collect approximately 17 sludge samples from the facultative lagoon and analyze for heavy metals, PCB, nitrogen, fecal coliform, and salmonella. In addition, determine sludge volume, moisture content and pH.

A. Sample Locations. The sludge samples shall be taken from the facultative lagoon at the locations identified in Figure 2. Samples shall consist of thirteen sample points, one field replicate, one split sample, and two equipment rinsate blanks for quality control.

B. Sample Collection.

1. **Duration**. Sample collection will require a minimum of four hours in the field.

2. Personnel Required. The sample team shall consist of two sample collectors and one person providing on-site coordination. Duties shall be divided up among team members as follows:

- equipment preparation and cleaning (1)
- sample collection (1)
- sample labeling and logging (1)

3. Equipment Required. Sludge samples will be collected in accordance with SW-846, Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods. Sludge collection equipment shall be an Sludge Judge (TM), Eckman Dredge, or other sampler acceptable to the ADEC. Samples shall be placed in an appropriate container that is certified as EPA level I or level II clean. The following is a list of the equipment required for this sampling event.

- Personnel Protective Equipment(as indicated in site health and safety plan)
- Small flat bottomed boat or other secure floatation device to traverse the lagoon
- Sample Collection Equipment:
  - Sludge Judge or Eckman Dredge
  - Sample Containers (EPA Level 1/II Clean)
- Sample Preparation Equipment
  - Stainless Steel Mixing Containers
  - Stainless Steel Trowels
- Decontamination Equipment
  - laboratory grade, non-phosphate detergent such as Liquinox
  - D.I. Water
  - 2 stainless steel buckets
- Paper Towels
- Marking Pens
- Chain of Custody Seals
- Sample Labels

4. Equipment Preparation and Cleaning. All equipment used for sample collection shall be in good condition and free of contamination. Sampling equipment shall be cleaned with a laboratory grade, non-phosphate detergent such as Liquinox between each sampling point.

5. Sample Marking and Logging. Samples shall be marked according to their grid coordinates, with the following information:

- grid coordinates,
- time and date,
- location relative to the lagoon
- name of samplers

Sample points shall be logged in the field with the following information:

- sample number
- grid coordinates
- location relative to the lagoon
- time and date of sampling
- name of samplers
- any unusual observations
- physical description of soil (rocky, sandy, etc.)
- weather (rain, wind, etc.)

D. Sample Preservation, Preparation, and Shipment. Proper sample handling requires the selection of appropriate sample containers, preservation procedures, and holding times for specific analyses.

1. Preservation. Sample containers shall be certified clean per EPA protocol and shall remain sealed until ready for use. Upon completion of sampling and labeling, samples shall be kept in a cooler until they can be analyzed. The maximum holding time for the required analysis is 14 days.

2. Preparation. Samples shall be homogenized and split in an area free of contamination or distractions, using stainless steel equipment. The procedure used for homogenization and splitting must be documented and consistent for all samples.

3. Shipment. Samples shall be shipped to Adak and picked up at the airport for delivery to the laboratory. Samples must be shipped within three days of collection to allow adequate time to meet holding time requirements.

Samples shall be packed for shipment in such a manner as to prevent any breakage of sample containers en-route. Samples shall be protected from breakage by using shock-absorbent packing material.

E. Decontamination Waste Management. The Contractor shall prepare and execute an addendum to existing Amchitka IDW management plans/procedures. The addendum will detail procedures for managing wastes generated during this sampling effort.

F. Sample Analysis. Samples shall be analyzed by a CLP Environmental Laboratory for the pollutants listed below.

Arsenic	Mercury	PCB
Cadmium	Molybdenum	fecal coliform
Chromium	Nickel	salmonella
Copper	Selenium	moisture content
Lead	Zinc	pH

IV. SITE HEALTH AND SAFETY. The Contractor shall provide an addendum to the Health and Safety Plan for field activities on Amchitka Island which specifically addresses safety hazards and concerns associated with this site. All personnel shall follow the site specific health and safety plan provided.

V. QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC).

A. Project Quality Assurance. Sampling and analytical quality assurance samples are required to establish the data quality for each analytical result. Sample management and documentation procedures shall be the same as those used for the original samples. However, a random sample number shall be assigned to the replicate sample to minimize handling, analyses, and data evaluation bias. The data quality required for this project is determined by the use of EPA Contract Laboratory Quality Assurance Protocols.

B. Field Quality Control. Field QC samples provide an estimate of the error or uncertainty associated with the sampling effort. Sampling error may result from variability in sample collection, storage, transportation, and sampling equipment decontamination procedures. Quality Control samples should make up approximately five percent of the total samples from any specific sampling round.

1. Replicate Samples. At least one replicate sample shall be collected per 20 samples collected. The replicate sample shall be collected immediately after the original sample is collected, adjacent to the original sample. Replicate samples provide a measure of the site variability. They may also be taken to avoid the loss of samples if breakage occurs.

2. Split Samples. At least one sample shall be split per 20 samples submitted to the contract laboratory for analysis. The sample must be homogenized prior to splitting and the split sample must be given a random sample number. The split sample will provide a measure of the sample variability. It also indicates the consistency of analytical results from a single sample.

3. Blanks. Trip blanks and equipment blanks are used to identify and quantify potential sources of extraneous sample contamination which may be occurring in sampling or subsequent shipping. Two rinsate blanks shall be submitted for analysis.

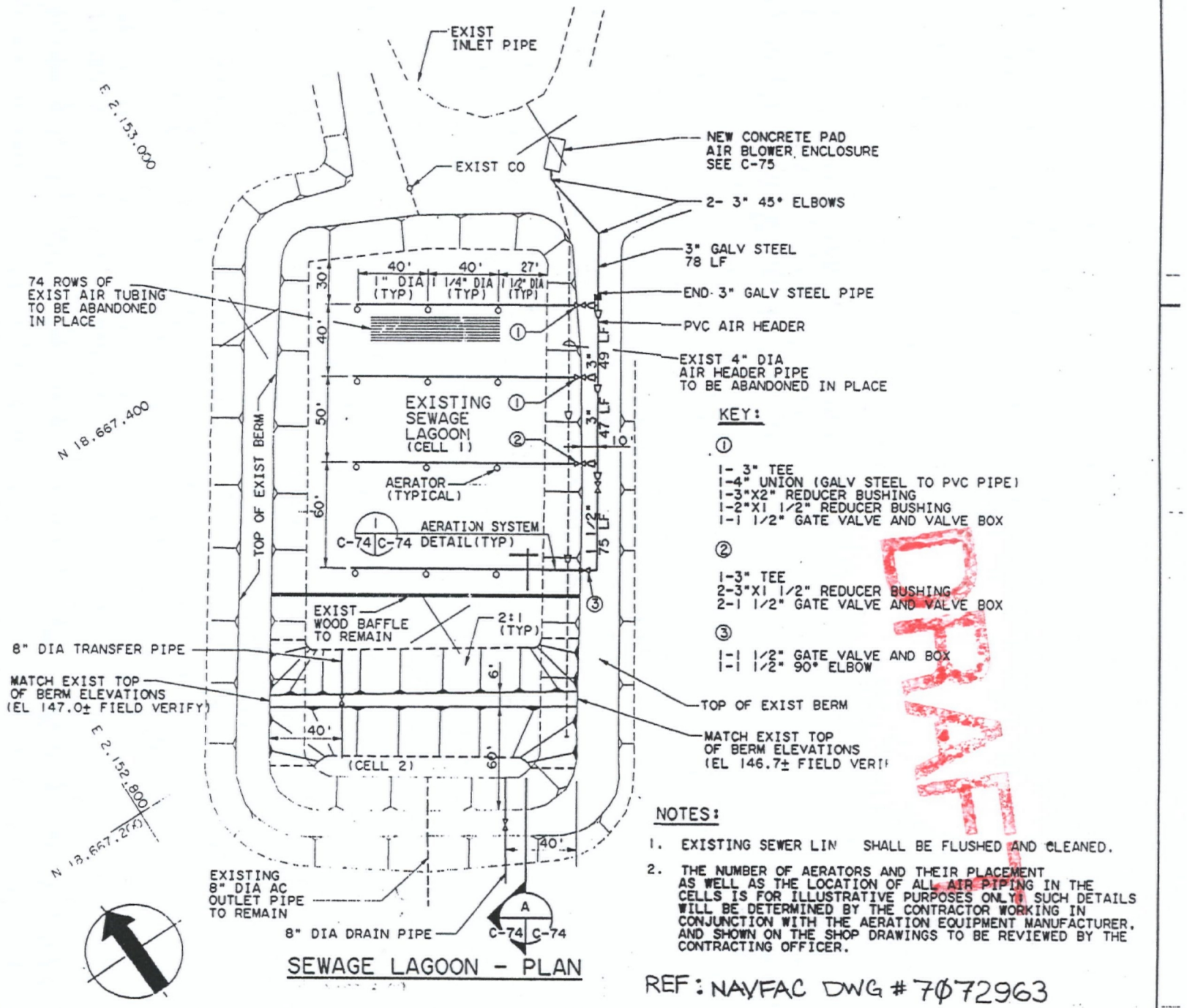
C. Analytical Quality Control. In the laboratory, field QC samples are supplemented with laboratory blanks, spiked standards, and additional duplicate analyses so that QC samples constitute at least ten percent of the analytical testing.

1. Contract Laboratory QC. The contract laboratory shall adhere to its required Quality Assurance Plan, which includes the use of US EPA approved "Contract Laboratory Procedures (CLP)," method blanks, surrogate spike analysis, and matrix spike analysis. The requirements for the types and numbers of laboratory QC samples shall depend on the referenced method.

2. Chain of Custody. Chain of custody forms are required to create a written record of the sample from the time of collection through laboratory analysis. Chain of custody forms and shipping papers shall be completely filled out and attached to the inside of the packages to ensure the integrity of the data received.

VI. COORDINATION.

All investigations at the site shall be coordinated with [ACOE and DOE field efforts].



SEWAGE LAGOON - PLAN

KEY:

①

1- 3" TEE
1-4" UNION (GALV STEEL TO PVC PIPE)
1-3"X2" REDUCER BUSHING
1-2"X1 1/2" REDUCER BUSHING
1-1 1/2" GATE VALVE AND VALVE BOX

②

1-3" TEE
2-3"X1 1/2" REDUCER BUSHING
2-1 1/2" GATE VALVE AND VALVE BOX

③

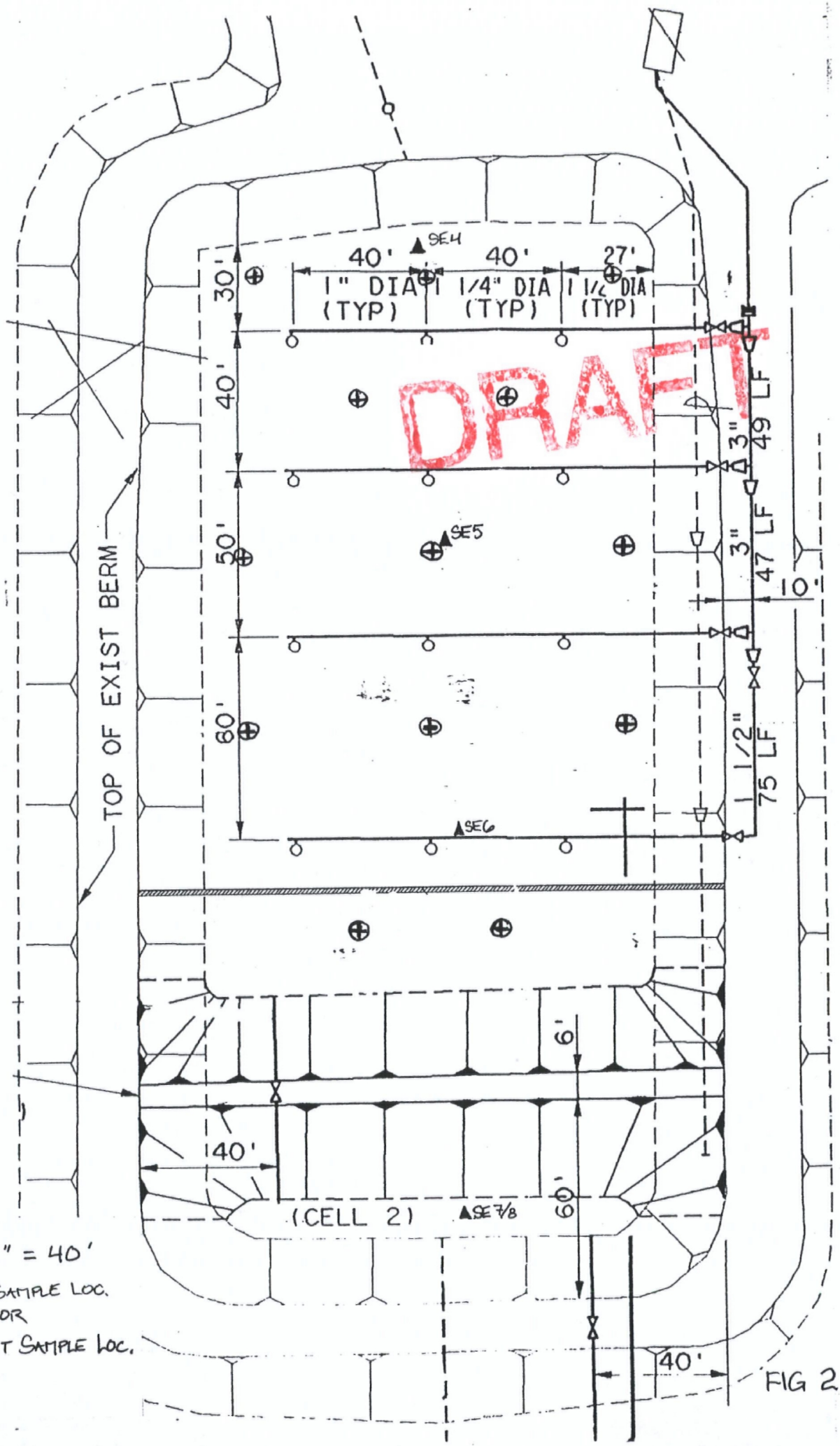
1-1 1/2" GATE VALVE AND BOX
1-1 1/2" 90° ELBOW

NOTES:

1. EXISTING SEWER LIN SHALL BE FLUSHED AND CLEANED.
2. THE NUMBER OF AERATORS AND THEIR PLACEMENT AS WELL AS THE LOCATION OF ALL AIR PIPING IN THE CELLS IS FOR ILLUSTRATIVE PURPOSES ONLY. SUCH DETAILS WILL BE DETERMINED BY THE CONTRACTOR WORKING IN CONJUNCTION WITH THE AERATION EQUIPMENT MANUFACTURER, AND SHOWN ON THE SHOP DRAWINGS TO BE REVIEWED BY THE CONTRACTING OFFICER.

REF: NAVFAC DWG # 7Ø72963

FIG 1



SCALE: 1" = 40'

▲ 1995 SAMPLE LOC.

O AERATOR

⊕ CURRENT SAMPLE LOC.

FIG 2

Table 11.2-2 Sewage Lagoon Summary of Detections from Off-Site Analysis

Sample Number/Analyte Group/Analyte	Concentration	Laboratory Qualifiers	Data Validation Qualifiers	Validation Results
B029SE011 Collocated with B029SE006				
Percent Moisture				
WATER	98.0000 %			
Volatile Organic Compounds				
2-BUTANONE (MEK)	1500.0000 ug/kg			
ACETONE	10000.0000 ug/kg			
TOLUENE	720.0000 ug/kg			
Semivolatile Organic Compounds				
BIS(2-ETHYLHEXYL)PHTHALATE	170000.0000 ug/kg			
ICP Metals				
ALUMINUM	32900.0000 mg/kg			
BARIUM	166.0000 mg/kg			
CALCIUM	17100.0000 mg/kg			
CHROMIUM	55.2000 mg/kg			
COPPER	580.0000 mg/kg			
IRON	51000.0000 mg/kg			
MAGNESIUM	13800.0000 mg/kg			
MANGANESE	917.0000 mg/kg			
VANADIUM	173.0000 mg/kg			
ZINC	1870.0000 mg/kg			
Arsenic				
ARSENIC	29.0000 mg/kg			
Lead				
LEAD	654.0000 mg/kg		J	N
Mercury				
MERCURY	6.3000 mg/kg			
Tentatively Identified Semivolatile Organic Compounds				
2-HEXADECEN-1-OL, 3,7,11,15-TETRAMETHYL-[R-[R,R-!	190000.0000 ug/kg	2z		
AROMATIC HYDROCARBON	89000.0000 ug/kg			
AROMATIC HYDROCARBON	98000.0000 ug/kg			
BENZENE, (1-PENTYLHEPTYL)-	95000.0000 ug/kg	1		
CHOLESTANOL	1800000.0000 ug/kg	2		
ERGOST-5-EN-3-OL, (3.BETA.)-	530000.0000 ug/kg	2		
OXYGENATED HYDROCARBON	200000.0000 ug/kg			

TABLE 1
REF: FOSTER WHEELER SITE INSPECTION RPT MARCH 1996